

AMENDMENTS TO THE CLAIMS

In the Claims:

The following listing of claims replaces all prior versions and listings of claims in the application.

Listing of Claims:

1. (Currently Amended) A phacoemulsification needle for removing a cataract from an eye, said needle comprising:

a shaft having a longitudinal axis,

a threaded portion and a hub, disposed at a proximal end of the shaft, for fixing the needle to an ultrasonic device;

a tip, disposed at a distal end of said shaft, ~~said tip~~ having:

an opening, defined by a rounded edge, disposed in a flat distal terminus perpendicular to the longitudinal axis of the shaft,

an essentially completely spherical surface except for the terminus, and

a larger outside diameter than said shaft; and

an aspiration lumen, extending through said shaft and said tip, in communication with the opening in the tip ~~having an opening communicating with said aspiration lumen, wherein said tip has a ball shaped surface and wherein the tip has a flat distal end comprising said opening.~~

2. (Original) The needle according to claim 1, wherein said tip has at its distal end rounded edges.

3. (Original) The needle according to claim 1, wherein said flat distal end is formed by said opening.

4. (Original) The needle according to claim 1, wherein the part of said aspiration lumen extending within the tip is rectilinear.

5. (Original) The needle according to claim 1, wherein the needle is angled.
6. (Original) The needle according to claim 1, wherein said opening has a larger diameter than the part of the aspiration lumen extending within said shaft.
7. (Original) The needle according to claim 1, wherein said aspiration lumen comprises a step within the tip.
8. (Original) The needle according to claim 1, wherein said opening has a diameter of approximately 0.8 mm.
9. (Original) The needle according to claim 2, wherein said edges have a radius of curvature of approximately 0.15 mm.
10. (Original) The needle according to claim 1, wherein said tip comprises a slit extending in longitudinal direction of the needle and communicating with said aspiration lumen.
11. (Currently Amended) A phacoemulsification needle for removing a cataract from an eye, comprising:
 - a shaft having a longitudinal axis,
 - a threaded portion and a hub, disposed at a proximal end of the shaft, for fixing the needle to an ultrasonic device;
 - a tip, disposed at a distal end of said shaft, ~~said tip~~ having:
 - an opening, defined by a rounded edge, disposed in a flat distal terminus perpendicular to the longitudinal axis of the shaft,
 - a smooth, continuous curved shape except for the terminus, and
 - a larger outside diameter than said shaft; and
 - an aspiration lumen, extending through said shaft and said tip, in communication with the opening in the tip ~~having an opening communicating with said aspiration lumen, wherein said tip has a ball-shaped surface and wherein the tip has a flat distal end comprising said opening.~~

12. (Original) The needle according to claim 11, wherein said tip has at its distal end rounded edges.

13. (Original) The needle according to claim 11, wherein said flat distal end is formed by said opening.

14. (Original) The needle according to claim 11, wherein the part of said aspiration lumen extending within the tip is rectilinear.

15. (Original) The needle according to claim 11, wherein the needle is angled.

16. (Original) The needle according to claim 11, wherein said opening has a larger diameter than the part of the aspiration lumen extending within said shaft.

17. (Original) The needle according to claim 11, wherein said opening has a smaller diameter than the part of the aspiration lumen extending within said shaft.

18. (Original) The needle according to claim 11, wherein said aspiration lumen comprises a step within the tip.

19. (Original) The needle according to claim 11, wherein said aspiration lumen comprises a step within the shaft.

20. (Original) The needle according to claim 11, wherein said opening has a diameter of 0.3 mm to 0.8 mm.

21. (Original) The needle according to claim 12, wherein said edges have a radius of curvature of 0.1 mm to 0.15 mm.

22. (Original) The needle according to claim 11, wherein said tip comprises a slit extending in longitudinal direction of the needle and communicating with said aspiration lumen.

23. (Original) The needle according to claim 11, wherein said shaft comprises an opening extending through its surface, the opening communicating with said aspiration lumen.

24. (Currently Amended) A phacoemulsification needle for removing a cataract from an eye, comprising:

a shaft,

a threaded portion and a hub, disposed at a proximal end of the shaft, for fixing the needle to an ultrasonic device;

a tip, disposed at a distal end of said shaft, ~~said tip~~ having:

a distal terminus and at least two openings arranged near the terminus,

an overall smooth, continuous curved shape, and

a larger outside diameter than said shaft; and

an aspiration lumen, extending through said shaft and said tip, in communication with the openings near the terminus ~~the tip having an opening communicating with said aspiration lumen, wherein said tip has a curved shape, the tip comprising a distal end and at least two openings being arranged in the region of said distal end.~~

25. (Original) The needle according to claim 24, wherein the tip comprises four openings.

26. (Original) The needle according to claim 24, wherein the distal end has a curved surface.

27. (Previously Presented) The needle according to claim 24, wherein the at least two openings have rounded edges.

28. (Previously Presented) The needle according to claim 24, wherein said lumen is divided into sublumens, each sublumen ending in one of said openings.

29. (Previously Presented) The needle according to claim 28, wherein said sublumens are arranged in an angle to said lumen and to a longitudinal axis of the shaft.

30. (Previously Presented) The needle according to claim 29, wherein the angle is approximately 45°.

31. (Previously Presented) The needle according to claim 28, wherein the sublumens extend only in the tip.

32. (Previously Presented) The needle according to claim 24, wherein the needle is angled

33. (Currently Amended) A method of phaco-emulsification, comprising:

providing a needle having:

a shaft having a longitudinal axis;

a tip, disposed at a distal end of said shaft, ~~said tip~~ having:

an opening, defined by a rounded edge, disposed in a flat distal terminus perpendicular to the longitudinal axis of the shaft,

an essentially completely spherical surface except for the terminus, and

a larger outside diameter than said shaft, and

an aspiration lumen, extending through said shaft and said tip, in communication with the opening in the tip ~~having an opening communicating with said aspiration lumen, wherein said tip has a ball-shaped surface and wherein the tip has a flat distal end comprising said opening;~~

inserting said tip in an eye having a cataract;

vibrating said tip with substantially ultrasonic vibration;

breaking substantially said cataract into pieces with said tip; and

aspirating substantially said pieces through said aspiration lumen.

34. (Currently Amended) A method of phaco-emulsification, comprising:

providing a needle having:

a shaft having a longitudinal axis;

a tip, disposed at a distal end of said shaft, ~~said tip~~ having:

an opening, defined by a rounded edge, disposed in a flat distal terminus

perpendicular to the longitudinal axis of the shaft,

a smooth, continuous curved surface except for the terminus, and

a larger outside diameter than said shaft, and

an aspiration lumen, extending through said shaft and said tip, in communication with the opening in the tip ~~having an opening communicating with said aspiration lumen, wherein said tip has a curved shape and wherein the tip has a distal end comprising said opening;~~

inserting said tip in an eye having a cataract;

vibrating said tip with substantially ultrasonic vibration;

breaking substantially said cataract into pieces with said tip; and

aspirating substantially said pieces through said aspiration lumen.

35. (Currently Amended) A method of phaco-emulsification, comprising:

providing a needle having:

a shaft;

a tip, disposed at a distal end of said shaft, ~~said tip~~ having:

a distal terminus and at least two openings arranged near the terminus,

an overall smooth, continuous curved shape, and

a larger outer diameter than said shaft, and

an aspiration lumen, extending through said shaft and said tip, in communication with the openings in the tip ~~having an opening communicating with said aspiration lumen, wherein said tip has a curved shape, the tip comprising a distal end and at least two openings being arranged in the region of said distal end;~~

inserting said tip in an eye having a cataract;

vibrating said tip with substantially ultrasonic vibration;

breaking substantially said cataract into pieces with said tip; and

aspirating substantially said pieces through said aspiration lumen.

36. (New) The method according to claim 33, wherein said needle includes a threaded portion and a hub, disposed at a proximal end of the shaft, for fixing the needle to an ultrasonic device.

37. (New) The method according to claim 34, wherein said needle includes a threaded portion and a hub, disposed at a proximal end of the shaft, for fixing the needle to an ultrasonic device.

38. (New) The method according to claim 35, wherein said needle includes a threaded portion and a hub, disposed at a proximal end of the shaft, for fixing the needle to an ultrasonic device.